



شركة المصنع السعودي لأجهزة الإطفاء  
SAUDI FACTORY FOR FIRE EQUIPMENT Co.

Empowering  
a **Safer Future** for  
the Kingdom



Carbondioxide  
Fire Suppression System

Technical  
Data  
Sheets

Quality Approvals for Various Products and Services



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## Extinguishing Agent

### Carbondioxide (CO2)

#### Description

Carbon Dioxide is an odorless, colorless, electrically non-conductive, non-corrosive, and non-deteriorating inert suppression agent. Carbon Dioxide is approximately 50% heavier than air, and is normally present in the atmosphere at about 0.03% by volume. Carbon Dioxide is instrumental in controlling respiration and other vital responses in animals and humans, but it WILL NOT support life.

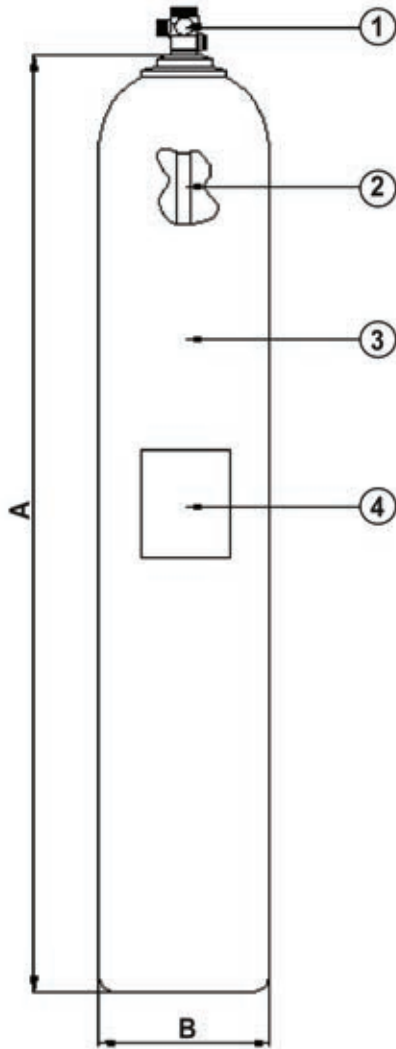
Carbon Dioxide is a standard commercial product commonly used for carbonating beverages, fast-freezing food products, purging pipes and tanks, medical purposes, and a multitude of additional tasks. It is also used for fire fighting purposes: i.e. hose reels, portable hand extinguishers, and engineered fixed pipe systems. Carbon Dioxide is available in most large cities and seaports throughout the world.

Carbon Dioxide extinguishes fire by reducing the oxygen content of the protected space and/or local flame front to a point where it will not support combustion. Oxygen reduction below 16% by volume will extinguish most fires. Surface or "flash" type fires (oils, paints, etc.) are quickly extinguished. Deep-seated or "smoldering" type fires (paper, baled cotton, clothing, etc.) are extinguished by the prolonged action of a high concentration of Carbon Dioxide. Retaining the agent within the protected space reduces the fire's ability to re-ignite. In addition, Carbon Dioxide has a cooling effect on the surrounding atmosphere that has been found to be a benefit to fire extinguishment.

#### Specification

Chemical Name	Carbon Dioxide
Chemical Formula	CO <sub>2</sub>
Molecular Weight	44.01
Critical Temperature	31.00C
Boiling Point	-109.30F
Vapor Pressure @ 68OF	832 PSIG
Vapor Density @ 68OF	1.53
Solubility in Water @ 68OF	87.8% by Volume
Appearance and Odor	Colorless Gas, Slight Pungent Odor

## Extinguishing Agent Cylinder



Size : A=1515mm, B= 266mm  
Model : SFC-45  
Capacity : 45 Kgs

### Description

CO<sub>2</sub> cylinders are factory filled to capacity; partial fills are not allowed. The cylinders may be utilized in single or multiple cylinder applications as needed.

Carbondioxide cylinders must be floor mounted, with the discharge valve in the vertical (up) position. Horizontal mounting of cylinders is not allowed. The cylinders may be used in single or multiple cylinder applications as needed.

Cylinders are shipped from the factory with a protective shipping cap in place. Filled cylinders shall be secured during transport and while in storage in accordance with DOT and OSHA requirements. Upon installation, all cylinders shall be secured by cylinder straps or in a suitable racking arrangement. Once secured by a strap or cylinder rack, the safety/shipping cap is removed. The caps should then be stored in a suitable and nearby area for future use.

The high pressure seamless steel CO<sub>2</sub> cylinders has concave base and manufactured in accordance with 84/525 EEC.

### Specification

Cylinder Material	Chrome Molybdenum Steel
Head Valve Material	Brass
Hydraulic Test Pressure	250 Bar
Finish	Primed and Painted in accordance with BS 4800:04E53
Discharge Valve Assembly	1" NPT
Simphon Tube	
Identification Label	

### Important Note:

All CO<sub>2</sub> System to be provided with efficient detection system to assure that discharge of gas to be in case of fire only.

## Cylinder Mounting Strap

### Single Cylinder



#### Application

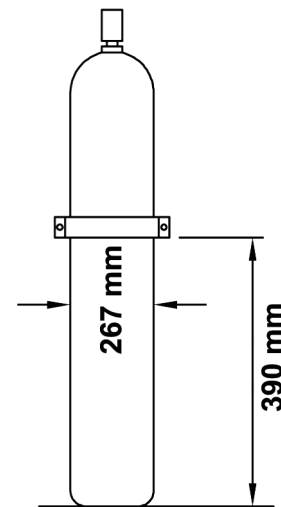
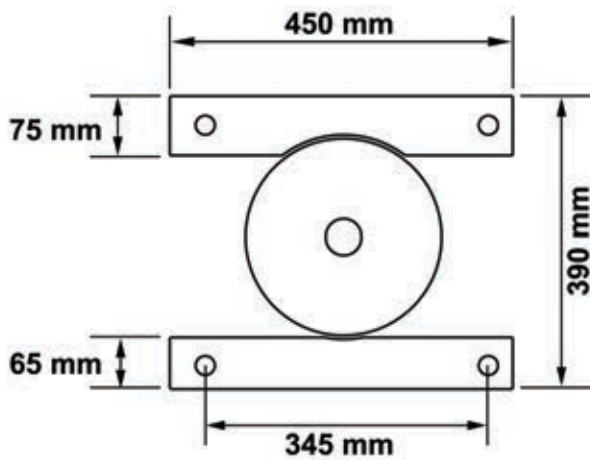
Cylinder straps are used to secure the cylinder in place, on a single cylinder system, in accordance with NFPA 12 requirements. The straps may be secured to any structurally solid surface. Anchoring into plaster or any other facing material is not acceptable.

#### Description

Cylinder Straps are made of steel, primed and painted red with a baked enamel finish for corrosion resistance. All mounting hardware is supplied by the system installer.

#### Specification

Material	Carbon Steel
Finish	Red Gloss Enamel



## Head Valve

### Valve for Fixed Installation

**P/N: F2021002**

#### Description

SFFECO Carbon Dioxide cylinders are equipped with a cylinder valve designed to hold the Carbon Dioxide agent in the cylinder until actuated, either automatically or manually. The conversion is completed by installing an emergency manual lever actuator. The cylinder valve assembly has a forged brass body. The pressure necessary to open the valve is 100–110 psig (689–758 kPa) at 70°F. (21.1°C.). All cylinder valves are equipped with a Safety Relief Disc that will rupture to relieve excess pressure should it reach a level in excess of 2,650 psi (18,248 kPa) in accordance with NFPA 12, Section 1–8.5.2.



#### Specification

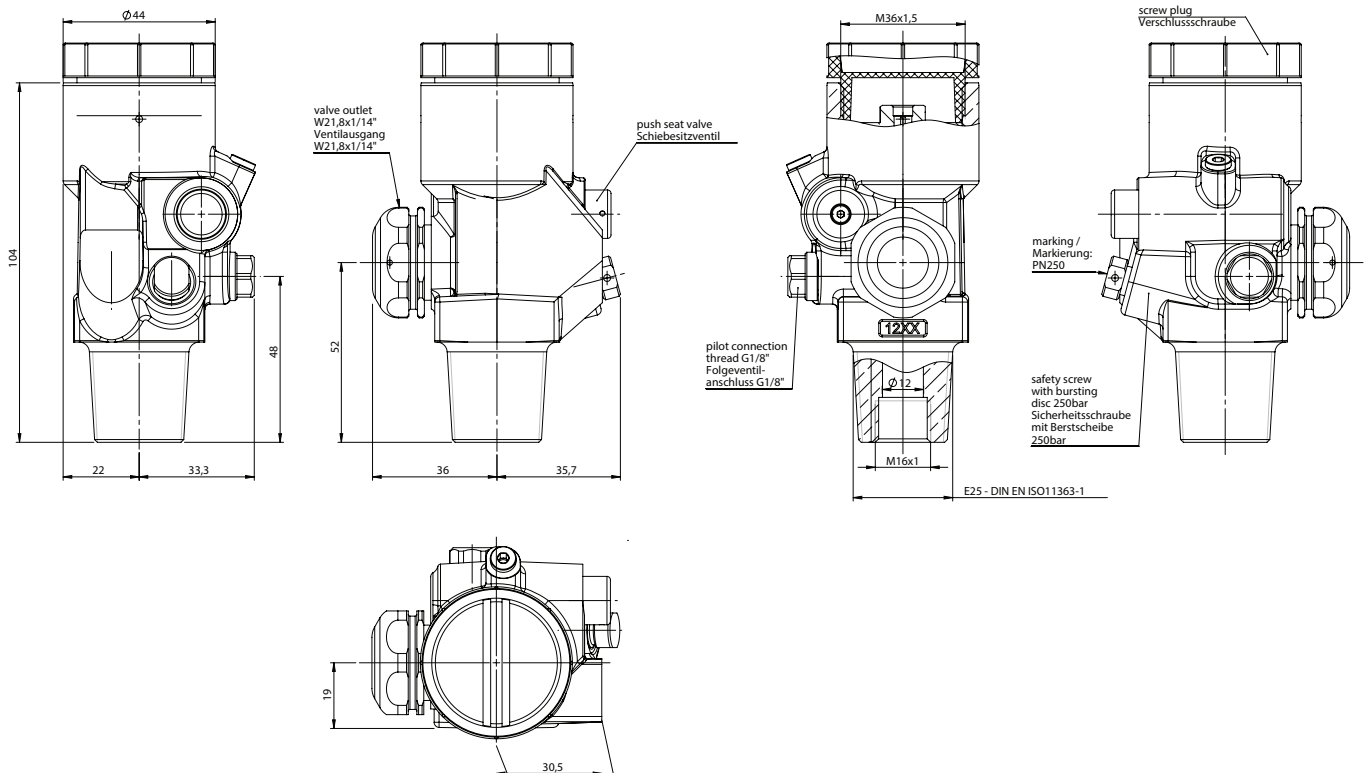
Material	Brass
Thread	25E - W21, 8x 1/14"
Test Pressure	360 Bar

**Can be used in Combination with any one of the**

**P/N: XF11280**

**P/N: F1120016**

**P/N: F1120015**



E25 - DIN EN ISO11363-1

## Control Head Valve

### Electrical and Pressure Operated

**P/N: F2031002**



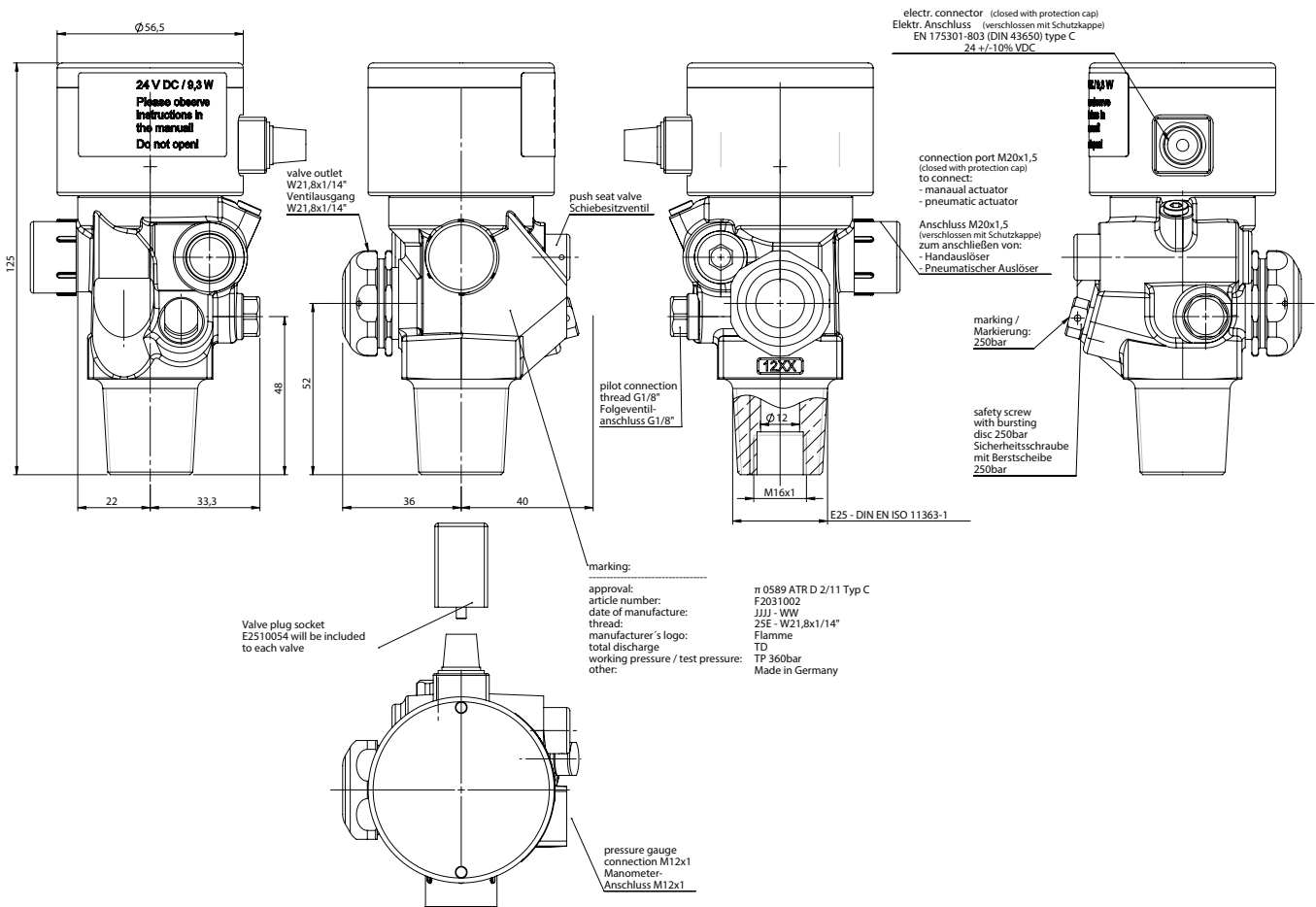
#### Description

This type of control head valve operates the system cylinder electrically through electrical solenoid actuator after receiving an electronic initiating signal from the control panel. Also this type of control head valve operates the system cylinder through electrical principle, which allows the CO2 pressure to open the valve piston in order to discharge the gas in the protected area.

#### Specification

Material	Brass
Thread	25E - W21, 8x 1/14"
Test Pressure	360 Bar

**Can be used in Combination with P/N: F1120017**



## Control Head Valve

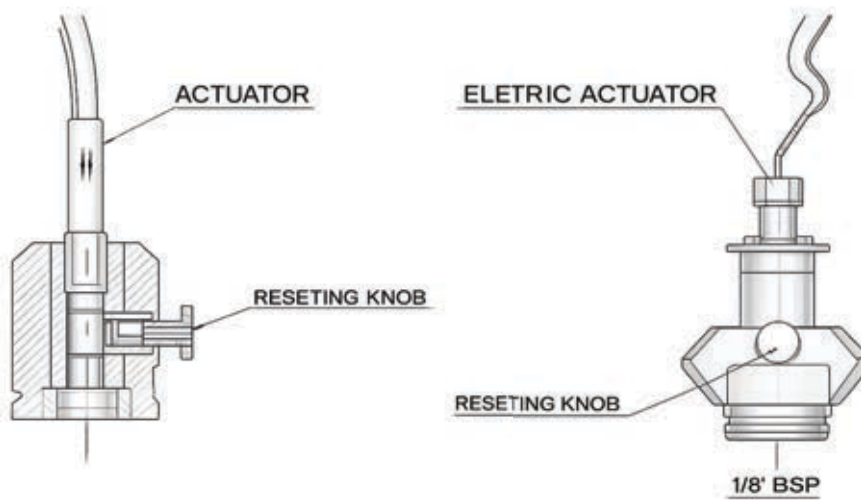
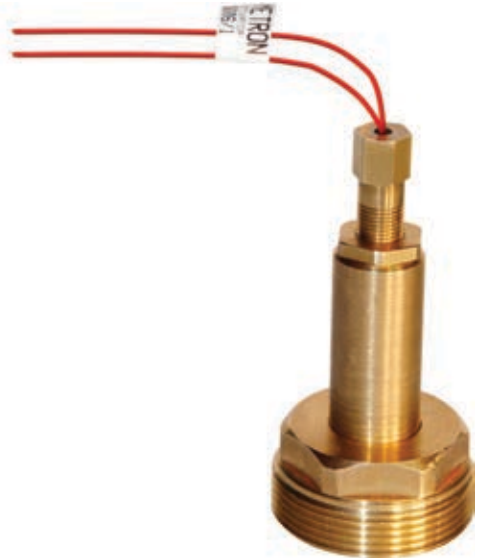
### Electric Actuated

P/N: XF11280

#### Description

This type of control head valve operates the system cylinder electrically through electrical pin type pyrotechnic actuators.

Can be used in Combination with F2021002



## Control Head Valve

### Pneumatic Release Device

**P/N: F1120016**



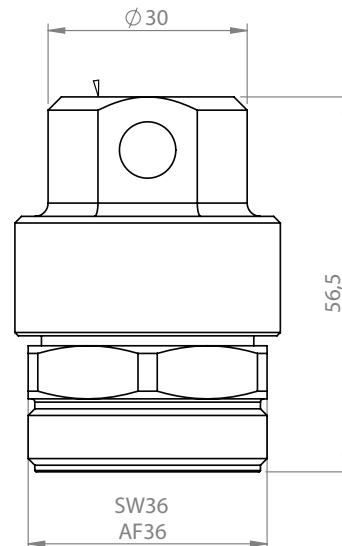
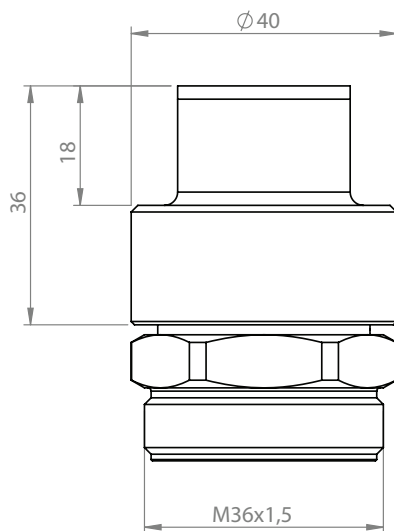
#### Description

This type of control head valve operates the system cylinder through pneumatic principle, which allows the CO<sub>2</sub> pressure to open the valve piston in order to discharge the gas in the protected area.

#### Specification

Material	Brass
Pilot Pressure min	20 bar for P1=300bar
Pilot Pressure max	Pmax = 360 bar
Torque	25Nm ±2

Can be used in Combination with F2021002



## Control Head Valve

### Pneumatic – Manual Release Device

**P/N: F1120015**

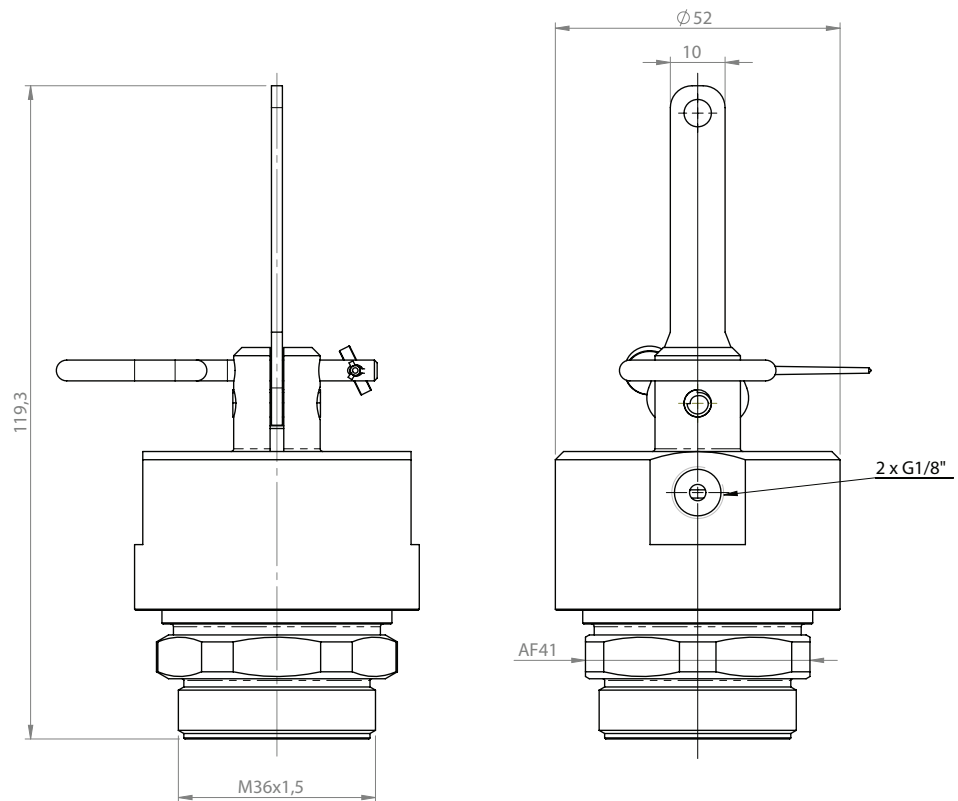


#### Description:

This type of control head valve operates the system cylinder through pneumatic principle, which allows the CO<sub>2</sub> pressure to open the valve piston in order to discharge the gas in the protected area. The provision of the lever allows the manual operation too.

#### Can be used in Combination with F2021002

Specification	
Material	Brass
Pilot Pressure min	Pmin = 8 bar for P1=300bar
Pilot Pressure max	Pmax = 300 bar
Torque	25Nm ±2



## Control Head Valve

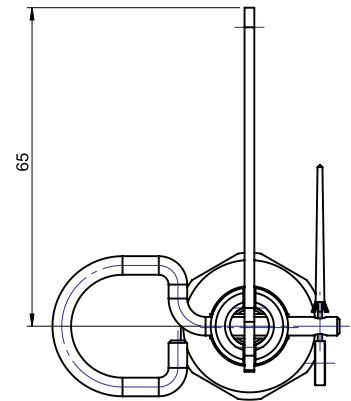
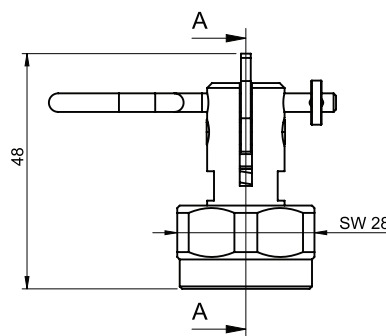
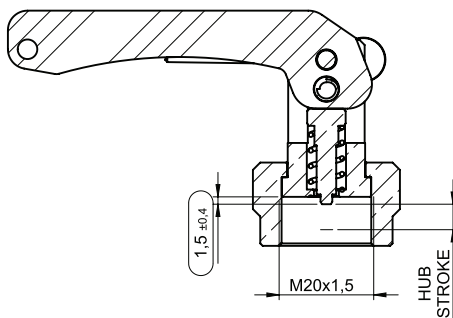
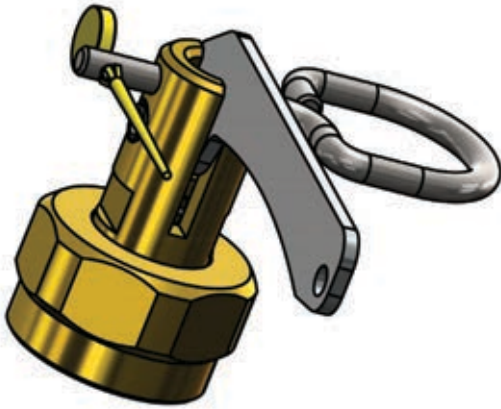
### Pneumatic – Manual Release Device

**P/N: F1120017**

#### Description:

This type of control head valve operates the system cylinder through pneumatic principle, which allows the CO<sub>2</sub> pressure to open the valve piston in order to discharge the gas in the protected area.

**Can be used in Combination with F2031002**



#### Assembly Instruction:

Assemble the manual actuator only in inactivated state!

(Retracted pin, lever secured with safety pin!)

Screw the manual actuator on the corresponding connection port of valve F203

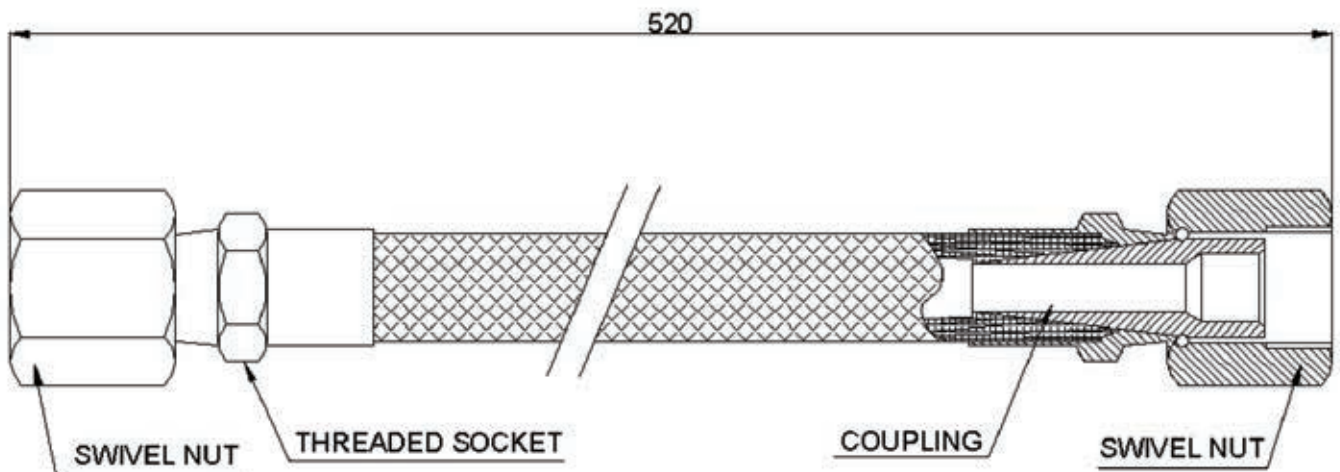
(Torque: 15 +\_1Nm), the alignment of the lever can be orientated in any position

## Discharge Flexible Hose

**P/N: SCO-006**

### Description

CO<sub>2</sub> discharge flexible hose is used to convey the CO<sub>2</sub> gas from the outlet of the cylinder to the discharge manifold. This made of reinforced flexible rubber tested at 480 bar to withstand high pressure with stainless steel of brass coupling and swivel joint.



### Dimension

Connection : 21.7 x 1.814  
Nominal Diameter : 10 mm.

### Specification

Hose Material	Rubber
Couplings	Steel S300 Cadmied
Service Pressure	240 bar
Test Pressure	400 bar
Burst Pressure	960 bar

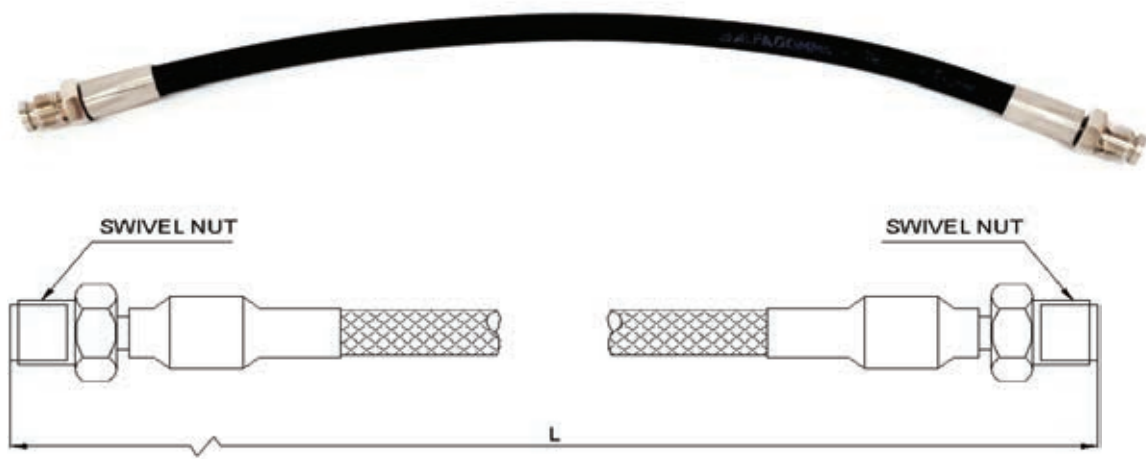
## Pneumatic Flexible Hose

**P/N: SCO-007**

### Description

The pneumatic flexible hose is used when two or more cylinders are in use for one system. The first cylinder is actuated through electric actuator while the rest of cylinders will be pneumatically operated through the pneumatic hose.

Hose are interconnected on the ports of the pressure actuators. The CO2 gas pressure applied on the actuators opens the cylinder valves simultaneously.



### Dimension

Connection : 1/8" BSP

### Specification

Hose Material	Rubber
Couplings	Steel S300 Cadmied
Service Pressure	240 bar
Test Pressure	400 bar
Burst Pressure	960 bar

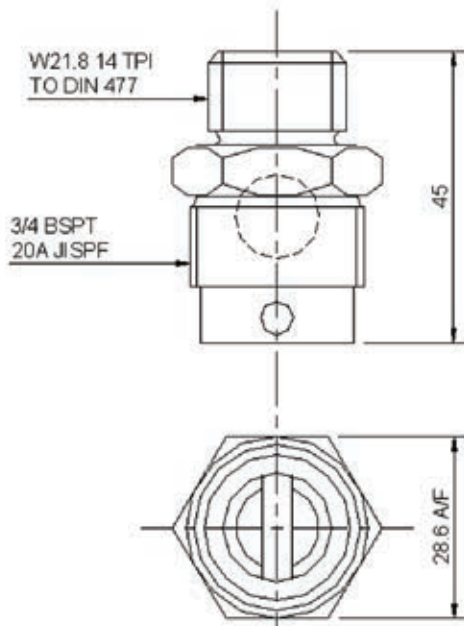
## Non Return Valve

**P/N: SCO-008**



### Description

The Check Valve is used to isolate the “Main and Reserve” supplies in a SFFECO Carbon Dioxide system. The Check Valve prevents pressurization of the “Reserve Bank” of Carbon Dioxide cylinders by blocking the flow of agent from the “Main” system discharge piping. This allows a common discharge manifold and nozzle piping network to be used on “Main and Reserve” system installations.



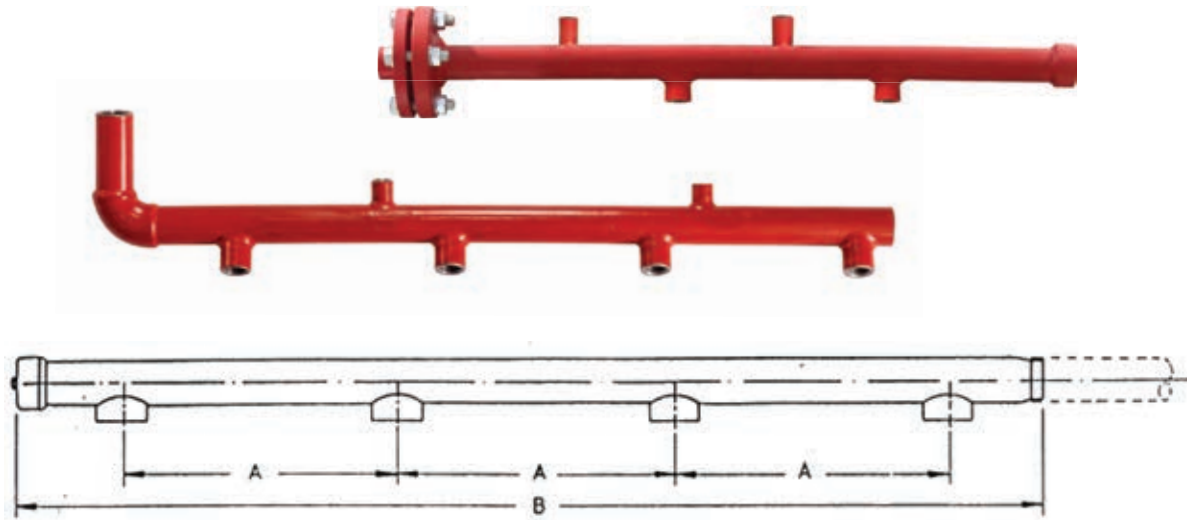
### Specification

Valve Body Material	Brass
Ball	Carbon Steel
Maximum Pressure	250 bar

## Discharge Manifold

### Description

The Check Valve is used to isolate the “Main and Reserve” supplies in a SFFECO Carbon Dioxide system. The Check Valve prevents pressurization of the “Reserve Bank” of Carbon Dioxide cylinders by blocking the flow of agent from the “Main” system discharge piping. This allows a common discharge manifold and nozzle piping network to be used on “Main and Reserve” system installations.



CYLINDER SIZE	DIM. "A" (MM)	DIM. "B" (MM)				
		2 CYL.	3 CYL.	4 CYL.	5 CYL.	6 CYL.
100 lbs.	305	625	930	1235	1540	1845

### Specification

Manifold and discharge piping sizes are calculated by computer to comply with NFPA Standards and are dependent on the pipe work configuration.

All manifolds are supplied with end mounted discharge outlets.

The integral non-return valve is a fold away flap type to ensure minimum orifice restriction.

Material to B.S. 5306 Part 5 Section 10.3.3. Proof Test 90 Bar.

## Radial Nozzle

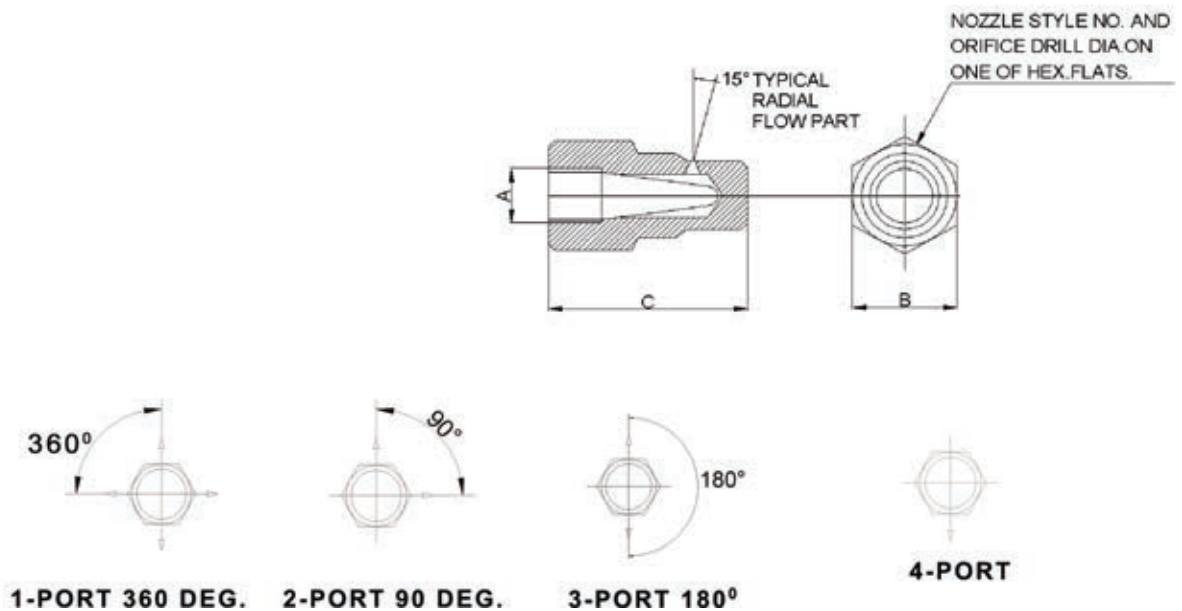
**P/N SCO10-009**



### Description

The SFFECO radial nozzle (P/N SCO10-009) is used for Total Flooding applications to deliver the agent into the hazard area protected by Carbon Dioxide system.

Nozzles are made of brass or stainless steel in different types, shapes and diameters to assure the effectiveness of extinguishing agents as per system design and quantity of gas required.



NOZZLE SIZE			PURCHASE CODE
A	B	C	
1/6"	7/8"	123/32"	0678
3/8"	1"	127/32"	0679
1/2"	1 1/8"	2 1/16"	0680
3/4"	1 3/8"	2 5/16"	0681
1"	1 5/8"	2 11/16"	0682
1 1/4"	2"	3 1/16"	0683
1 1/2"	2 1/4"	3 7/16"	0684
2"	3"	3 15/16"	0685

### NOTE

While placing order, please refer to the flow calculations and mention nozzle size and drill properly

## 'S' Type Discharge Nozzle

P/N: SCO-010



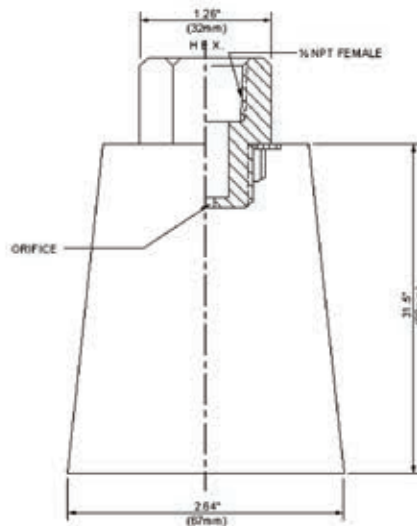
### Description

The SFFECO 'S' type discharge nozzle (P/N SCO-010) is used for Local and Total Flooding applications to deliver the agent into the hazard area protected by Carbon Dioxide system.

Nozzles are made of brass in different types, shapes and diameters to assure the effectiveness of extinguishing agents as per system design and quantity of gas required.

### Specification

Body Material	Brass
Finish	Red Paint



## Main/Reserve Switch (Optional)



### Description

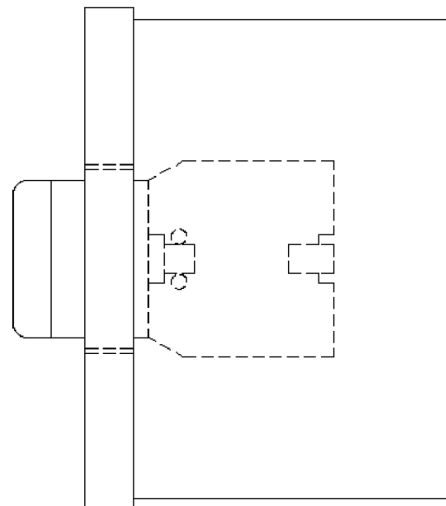
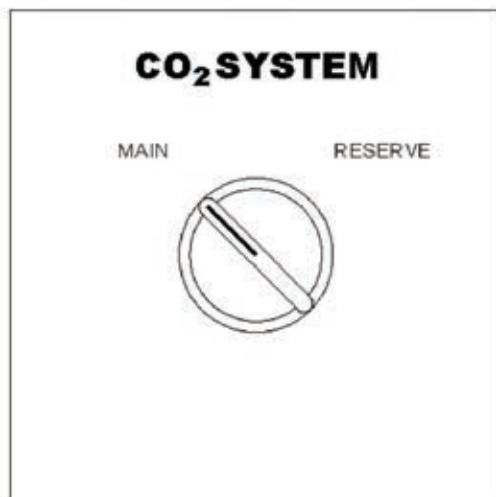
The “Main” to “Reserve” switch is used with systems that incorporate main and reserve (back-up) agent storage. The switch may utilize 1 or 2 Form “C” Contact blocks which will provide an electrical path to either the “Main” or “Reserve” releasing modules.

Following a system discharge, reset any field devices. Once all devices are in a stand-by status the Main-Reserve Switch may be moved to the “Reserve” position. The Control Panel may then be reset to a normal mode for uninterrupted SFFECO protection. The empty “main” containers can be removed for recharge. After the containers in the “Main” system have been recharged, the switch may be returned to the “Main” position.

The switch may be mounted to a standard 4” electrical box or others.

### DIMENSIONS

Width	105 mm
Height	105 mm
Depth	75 mm



## Warning Signs

### Application

Instructional signs are provided to inform personnel of any potential hazards they face when operation certain devices or working within areas protected by CO2 systems.



Optional: Sign in every nearby space where carbon dioxide could accumulate to hazardous levels.



Sign in Every Protected Space.



Optional: Sign outside each entrance to carbon dioxide storage room



Sign at Every Entrance to Protected Space

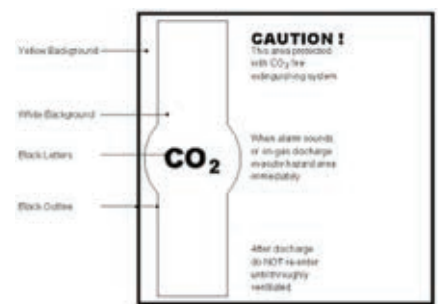
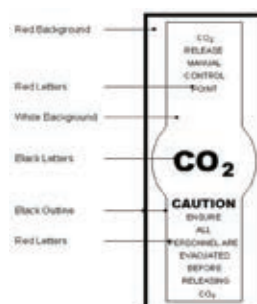


Optional: Sign at every entrance to protected space for systems provided with a wintergreen odorizer.

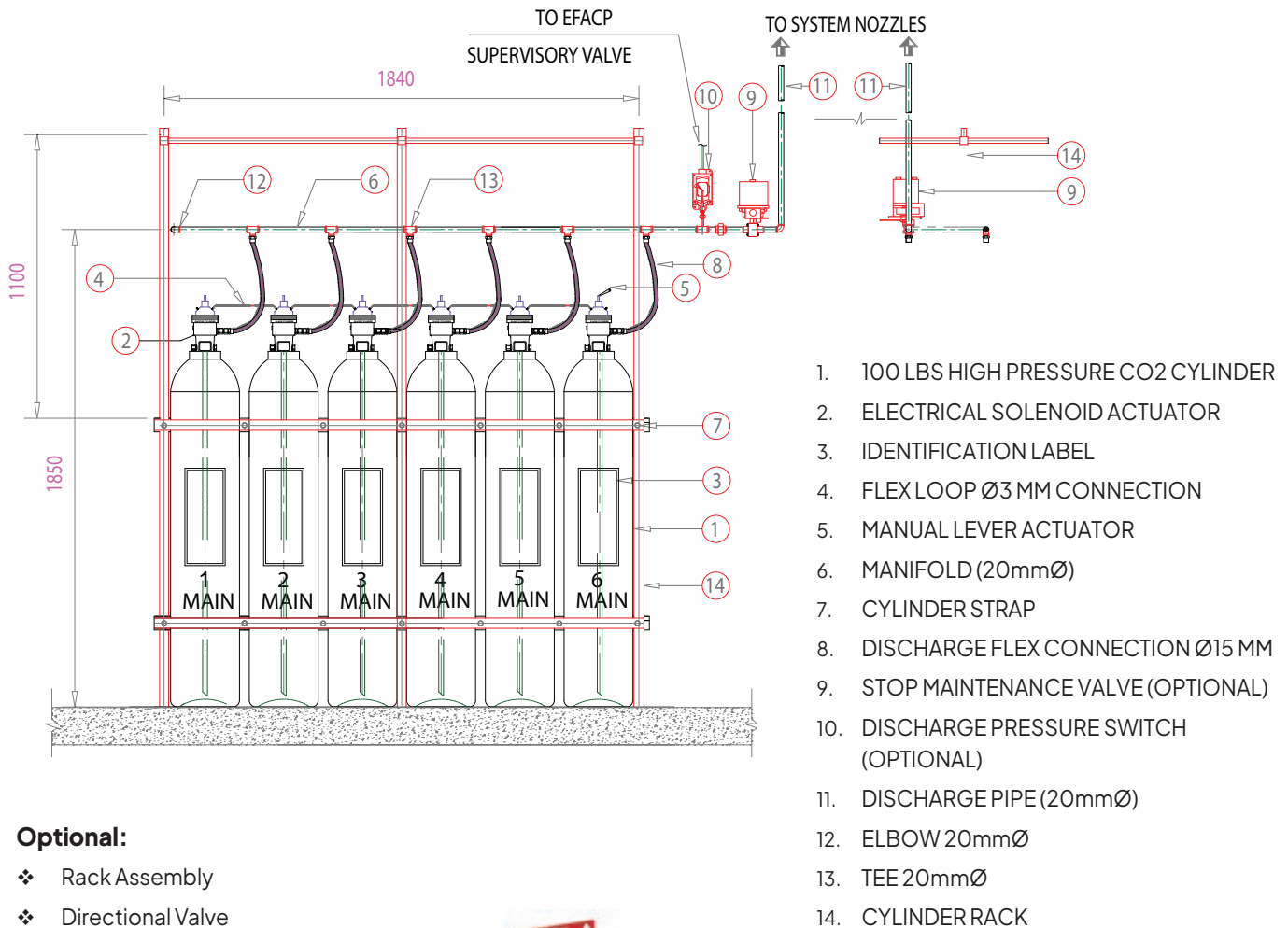


Sign at Every Manual Actuation Station

This type of warning signs are as per latest NFPA editions, before they were like



## Typical Arrangement



### Optional:

- ❖ Rack Assembly
- ❖ Directional Valve



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Since 1983, SFFECO has been a trusted name in fire protection, known for innovation and quality worldwide.

With state-of-the-art facilities in Riyadh and Dubai, we deliver a complete range of firefighting solutions that meet international standards.

Our innovative approach and comprehensive product portfolio make SFFECO the one-stop destination for reliable fire protection products and services.

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